

THAT WHICH IS CLAIMED IS:

1. A heterobifunctional polymer comprising:
a poly(alkylene oxide) backbone;
a first terminus comprising an acrylate group;
a second terminus comprising a target or a reactive moiety capable of
coupling to a target; and
a hydrolytically degradable linkage for releasing said target upon
hydrolysis.

2. A compound represented by the formula:



where

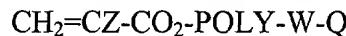
Z represents H or alkyl;

5 POLY and POLY' are poly(alkylene oxide) groups that can be the same or different and are represented by the formula $-(\text{CH}_2\text{CHRO})_n\text{-CH}_2\text{CHR-}$ in which R is H or alkyl, and n ranges from about 10 to about 4000;

Q represents a functional group; and

W represents a hydrolytically unstable linkage.

3. A compound represented by the formula:



where

Z represents H or alkyl;

5 POLY is poly(alkylene oxide), represented by the formula $-(\text{CH}_2\text{CHRO})_n\text{-CH}_2\text{CHR-}$ in which R is H or alkyl, and n ranges from about 10 to about 4000;

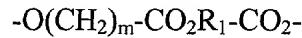
Q represents a functional group; and

W represents a hydrolytically unstable linkage.

4. The compound of either of Claims 2 or 3, wherein POLY and POLY' are poly(ethylene glycol).

5. The compound of either of Claims 2 or 3, wherein W comprises a hydrolyzable covalent bond selected from the group consisting of esters, orthoesters, imines, acetals, peptide bonds, and disulfides.

6. The compound of either of Claims 2 or 3, wherein W has a structure of:



where m ranges from 1 to 10, and R₁ is -CH₂-, -CH₂CH₂- or -CH(CH₃)CH₂-, or W has the

5 structure -O-(CH₂)_m-CO₂-.

7. The compound of either of Claims 2 or 3, wherein Q is selected from the group consisting of aldehydes, carboxylic acids, active esters, active carbonates, sulfonate esters, amines, hydrazides, orthopyridyl disulfides, and thiols.

8. A conjugate having a formula of:



where

Z is H or an alkyl group;

5 POLY and POLY' are poly(alkylene oxides) comprising groups that can be the same or different and are represented by the formula -(CH₂CHRO)_n-CH₂CHR- in which R is H or alkyl, and n ranges from about 10 to about 4000;

W represents a hydrolytically unstable linkage;

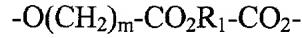
L is hydrolytically stable linkage;

10 x is an integer of 1-10; and

T is a target molecule.

9. The conjugate of Claim 7, wherein R is H.

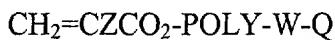
10. The conjugate of Claim 7, wherein W has the structure of:



where m ranges from 1 to 10, R₁ is selected from the group consisting of -CH₂-, -CH₂CH₂-, and -CH(CH₃)CH₂- or W has the structure -O-(CH₂)_m-CO₂-.

11. The conjugate of Claim 7, wherein T is selected from the group consisting of proteins, polysaccharides, oligonucleotides, lipids, vitamins, hormones, or small molecule pharmaceuticals.

12. A compound having the following structure:



where

Z represents H or alkyl;

5 POLY is a poly(alkylene oxide) represented by the formula $-(\text{CH}_2\text{CHRO})_n\text{-CH}_2\text{CHR-}$ in which R is H or alkyl, and n ranges from about 10 to about 4000;

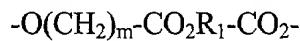
Q represents a functional group; and

W represents a hydrolytically unstable linkage.

13. The compound of Claim 11, wherein POLY is poly(ethylene glycol).

14. The compound of Claim 11, wherein W comprises a hydrolyzable covalent bond selected from the group consisting of esters, orthoesters, imines, acetals, peptide bonds, and disulfides.

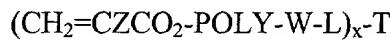
15. The compound of Claim 11, wherein W has the structure of:



where m ranges from 1 to 10 and R₁ is -CH₂-, -CH₂CH₂-, or -CH(CH₃)CH₂- or W has the structure -O-(CH₂)_m-CO₂-.

16. The compound of Claim 11, wherein Q is selected from the group consisting of aldehydes, carboxylic acids, active esters, active carbonates, sulfonate esters, amines, hydrazides, orthopyridyl disulfides, N-succinimidyl, and thiols.

17. A conjugate having the following structure:



where

Z represents H or alkyl;

5 POLY is a poly(alkylene oxide) comprising a group represented by the formula -(CH₂CHRO)_n-CH₂CHR- in which R is H or alkyl, and n ranges from about 10 to about 4000;

W represents a hydrolytically unstable linkage;

L is a hydrolytically stable linkage;

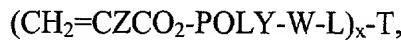
10 x is an integer from 1 to 10; and

T is a target molecule.

18. A polymer selected from the group consisting of compounds represented by the formula:



5 $\text{CH}_2=\text{CZCO}_2\text{-POLY-W-Q, and}$



where

Z is H or an alkyl group;

10 POLY and POLY' are poly(alkylene oxides) that can be the same or different and are represented by the formula -(CH₂CHRO)_n-CH₂CHR- in which R is H or alkyl, and n ranges from about 10 to about 4000;

W represents a hydrolytically unstable linkage;

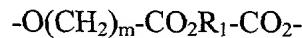
Q represents a functional group;

L is hydrolytically stable linkage;

15 x is an integer of 1-10; and

T is a target molecule.

19. The polymer composition of Claim 17, wherein W has the structure of:



where m ranges from 1 to 10, R₁ is selected from the group consisting of -CH₂-, -

5 CH₂CH₂-, and -CH(CH₃)CH₂- or W has the structure of -O-(CH₂)_m-CO₂-.

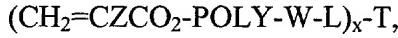
20. The polymer composition of Claim 17, wherein T is a protein.

21. The polymer composition of Claim 17, wherein R is H.

22. A hydrogel comprising a co-polymerization product of a multiacrylate and at least one compound selected from the group consisting of compounds represented by the formula:



5 $(\text{CH}_2=\text{CZ-CO}_2\text{-POLY-W-POLY'-L})_x\text{-T,}$



where

Z is H or an alkyl group;

10 POLY and POLY' are poly(alkylene oxides) that may be the same or different and are represented by the formula $-(\text{CH}_2\text{CHRO})_n\text{-CH}_2\text{CHR-}$ in which R is H or alkyl, and n ranges from about 10 to about 4000;

W represents a hydrolytically unstable linkage;

Q represents a functional group;

15 L is hydrolytically stable linkage;

x is an integer of 1-10; and

T is a target molecule.

23. The hydrogel of Claim 21, wherein said multiacrylate is selected from the group consisting of PEG diacrylates and N-vinylpyrrolidone.

24. The hydrogel of Claim 22, wherein said PEG diacrylate is $\text{CH}_2=\text{CHCO}_2\text{-PEG-O-CH}_2\text{CO}_2\text{CH}(\text{CH}_3)\text{CH}_2\text{CONH-PEGO}_2\text{CCH=CH}_2$ or $\text{CH}_2=\text{CHCO}_2\text{-PEG-O-CH}_2\text{CO}_2\text{PEG-O}_2\text{CCH=CH}_2$.

25. The hydrogel of Claim 21, wherein T is a protein.